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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,043	06/26/2003	Edward L. Sughure II	34035US	6408

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EXAMINER
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GRIFFIN, WALTER DEAN

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/607,043

Applicant(s)

SUGHURE ET AL.

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) 50-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/26/03.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-49, drawn to a desulfurization process, classified in class 208, subclass 208R.
- II. Claims 50-65, drawn to a particulate system, classified in class 502, subclass 60.

The inventions are distinct, each from the other because of the following reasons:

Inventions of Group II and Group I are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product as claimed can be used in a materially different process such as adsorption of components from a gaseous stream.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Bronwyn Welvaert on January 13, 2005, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-49. Affirmation of this election must be made by applicant in replying to this Office action. Claims 50-65 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 1-12 and 14-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Russ et al. (US 5,366,614) in view of Sughrue et al. (US 6,254,766 B1).

The Russ reference discloses a process for desulfurizing a hydrocarbon such as cracked gasoline. The process comprises contacting a hydrocarbon feedstock in a reforming zone with a particulate system comprising a physical mixture of a reforming catalyst and a sulfur sorbent. The mass ratio of catalyst to sorbent can range from 1:10 to 10:1. This combination of catalyst and sorbent would necessarily desulfurize the hydrocarbon while improving the octane of the hydrocarbon. Since reforming includes isomerization and cracking reactions, the catalyst would necessarily be effective, to some extent, for isomerization and cracking. The reforming catalyst comprises a platinum group metal and a support such as a zeolite. Specific zeolites include those identified as FAU and MFI. The zeolite type identified as MFI includes ZSM-5 zeolites. These zeolites may be in the hydrogen form and necessarily comprise rings of T atoms and have channel dimensionality as claimed. Operating conditions include temperatures from 260° to 560°C (500° to 1040°F). The catalyst/sorbent mixture can be regenerated and reactivated while other reactors remain on-stream. This regeneration would necessarily remove sulfur and coke from the particles. See column 1, lines 39-55; column 3, lines 27-34 and 52-68; column 5, lines 1, 2, and 66-68; column 6, lines 1-68; column 7, lines 1-15 and 43-64; column 9, lines 25-68; column 10, lines 1, 2, and 61-68; and column 11, lines 1-10.

The Russ reference does not disclose the oxidation and reducing steps to regenerate and reactivate the particulate system, does not disclose a zinc oxide and promoter metal sorbent, does not disclose the amount of or silica-alumina ratio of the zeolite in the catalyst, does not disclose

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the mean particle size range, and does not disclose that the particles have a Group A Geldart characterization.

The Sughrue reference discloses a desulfurization sorbent that comprises zinc oxide (10-90 wt%), alumina, silica, and nickel (5-50 wt%). Since alumina is present in the sorbent, an aluminate would necessarily be present. A substitutional solid solution as claimed would also be formed. The sorbent is regenerated by oxidation followed by reduction as claimed. The oxidation is performed at temperatures ranging from 800° to 1200°F and the reduction is performed at temperatures ranging from 100° to 1500°F. The sorbent has particle sizes in the range of 20 to 500 microns. See column 2, lines 59-65; column 4, lines 8 through column 6, line 26; and column 8, line 46 through column 9, line 36.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Russ by utilizing the sorbent of Sughrue in place of the sorbent disclosed by Russ because the sorbent is effective at desulfurizing the feed streams of Russ with minimal effect on the octane of the feed stream. One would necessarily use the regeneration and reactivation procedure that is effective for the sorbent of Sughrue.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Russ by utilizing any amount of zeolite and utilizing a zeolite having the claimed silica:alumina ratio because one would adjust the amounts in order to maximize the production of the desired product and because any zeolite that falls within the classes of zeolites disclosed would be expected to be effective in the process regardless of the silica:alumina ratio of the zeolite.

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It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Russ by utilizing particles with the claimed size and Group A Geldart characterization because as long as there is effective contact, one would utilize any type of particles in relation to size and Group A Geldart characterization.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Russ et al. (US 5,366,614) in view of Sughrue et al. (US 6,254,766 B1) as applied to claim 7 above, and further in view of Dodwell (US 6,429,170).

The previously discussed references do not disclose the use of perlite in the sorbent.

The Dodwell discloses a sorbent that comprises zinc oxide, silica, alumina, and a promoter metal. The silica is in the form of perlite. See column 3, lines 6-24.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by including perlite in the sorbent of Sughrue as the silica source because the sorbent life and attrition value of the sorbent can then be controlled.

### *Conclusion*

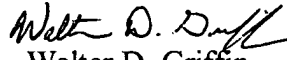
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art not relied upon discloses desulfurization processes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is (571) 272-1447. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Walter D. Griffin  
Primary Examiner  
Art Unit 1764

WG  
January 14, 2005